NHS Applied STEM Department
Course Descriptions – PLTW Engineering

Course Title	Grade	Description
Introduction to Engineering Design (IED) ● Full year course ● PLTW ● Helps with Honors or Technical Honors Diploma	9-12	➢ For students considering engineering as a career or who want to learn how to use CAD software to design objects. ➢ Foundational for other PLTW courses. ➢ Learn precision measurement, the design process, developing a product, reverse-engineering, with hands-on projects and 3D software. ➢ **Dual credit with IvyTech –DESN 101 & DESN 113 (6 credits/no cost)** ➢ **Prerequisite**: Pass Algebra I **or** STEM teacher approval ➢ **Honors credit**: 0.5 added to GPA
Principles of Engineering (POE) ● Full year course ● PLTW ● Helps with Honors or Technical Honors Diploma	10-12	➢ For students that are considering engineering as a career ➢ Study energy, robotics, forces, structures, and systems ➢ Very similar to physics ➢ Hands-on projects involving various energy types, building bridges, designing robotic systems to solve problems, etc. ➢ **Dual credit with IvyTech – DESN 104 (3 credits/no cost) MUST HAVE IED CREDIT FIRST!** ➢ **Prerequisite:** Pass IED **OR** STEM teacher approval ➢ **Honors credit:** 0.5 added to GPA
Civil Engineering and Architecture (CEA) ● Full year course ● PLTW ● Helps with Honors or Technical Honors Diploma	11-12	➢ Design buildings in all aspects – structural, plumbing, electrical, etc. – using Autodesk Revit software. ➢ Construct your own model house. ➢ Work with organizations like Habitat for Humanity (student designs are chosen and used sometimes nationally). ➢ Learn laws and codes governing construction of buildings. ➢ Learn how to survey a site before beginning construction. ➢ For students interested in Civil Engineering or Architecture. ➢ **Dual Credit with IvyTech (DESN 105 – 3 credits/no cost) MUST HAVE IED AND POE CREDIT FIRST!** ➢ **Prerequisite**: Pass IED & POE **OR** STEM teacher approval ➢ **Honors credit**: 0.5 added to GPA

Aerospace Engineering (AE) ● Full year course ● PLTW	11-12	➢ Learn the parts of various aircraft and how they affect flight. ➢ Explore aviation, propulsion, space travel, air traffic control, atmospheric conditions, & alternative energy. ➢ Hands-on projects exploring rockets, gliders, wing design, robotics, aerospace materials, atmosphere, satellites, & wind energy ➢ Field trips to aerospace industry, airports, etc. ➢ **Prerequisite**: Pass IED & POE **OR** STEM teacher approval ➢ **Honors credit**: 0.5 added to GPA
Course Title	**Grade**	**Description**
Digital Electronics ● Full year course ● PLTW	11-12	➢ PLTW course – grades 11 & 12 ➢ Learn about circuits and electronic components (resistors, capacitors, etc.) ➢ Build and program digital electronic devices. ➢ Learn good soldering technique ➢ **Honors credit:** 0.5 added to GPA ➢ **Dual Credit with IvyTech (PLTW EECT 112 Digital Fundamentals – 3 credits/no cost) MUST HAVE IED AND POE CREDIT FIRST!** ➢ **Prerequisite**: Pass IED & POE **OR** STEM teacher approval ➢ **Recommendation:** C or better in Algebra II
Computer Integrated Manufacturing (CIM)	11-12	➢ PLTW course – grades 11 & 12 ➢ Learn about the manufacturing process and how to use various types of robots and automation to manufacture items. ➢ **Honors credit:** 0.5 added to GPA ➢ **Dual Credit with IvyTech (PLTW DESN 195 Manufacturing Principles & Design – 3 credits/no cost) MUST HAVE IED AND POE CREDIT FIRST!** ➢ **Prerequisite**: Pass IED & POE **OR** STEM teacher approval ➢ **Recommendation:** C or better in Algebra II
Engineering Design and Development (EDD) ● Full year course ● PLTW	12	➢ PLTW course – senior capstone course ➢ Research, design, test, and produce your own invention or innovation. ➢ **Prerequisite**: Pass IED, POE, and one other PLTW course **OR** teacher approval ➢ **Honors credit**: 0.75 added to GPA

NHS Applied STEM Department
Course Descriptions – Technology Education

Course Title	Grade	Description
Introduction to Design Processes ● Full year course	9-12	➢ Introductory course for all non-PLTW Tech Ed courses ➢ Learn tool use and complete hands-on projects in engineering, construction, transportation, and manufacturing. ➢ Great intro class for students interested in manufacturing, design, architecture, construction, or transportation.
Introduction to Construction Full year course	10-12	➢ Investigate construction of residential, commercial, or industrial buildings – from plans to product. ➢ Learn all aspects of building design like tool usage, soil testing/surveying, foundation, framing, electrical, plumbing, drywall, etc. ➢ Build models to practice skills ➢ **Prerequisite:** Pass IED or Intro to Design Processes **OR** STEM teacher approval ➢ For students considering a career involving construction OR wanting to do a hands-on class.
Introduction to Transportation ● Full year course	10-12	➢ Intro to working with vehicles and vehicle systems. ➢ Hands-on, problem-based learning. LOTS of projects. ➢ Covers ALL forms of transportation – land, air, and water. ➢ **Prerequisite:** Pass IED or Intro to Design Processes **OR** STEM teacher approval ➢ For students considering a career in the transportation industry OR wanting to do a hands-on class.
Introduction to Advanced Manufacturing and Logistics ● Full year course ● Helps with Honors or Technical Honors Diploma	10-12	➢ Computer-based with virtual environments ➢ Explore the manufacturing process – from raw material to product – using virtual and hands-on activities. ➢ Explore the logistics involved in manufacturing. ➢ Design and make things for yourself, your family, the school, or the community using the laser cutter and other shop tools. ➢ http://www.dreamitdoitindiana.com ➢ **Dual credit with IvyTech MPRO 100 & 106– (6 credits/no cost).** ➢ **Earn 2 APICS and 1 MSSC certificate** ➢ **Honors credit:** 0.5 added to GPA ➢ **Prerequisite:** Pass IED or Intro to Design Processes **OR** STEM teacher approval
Advanced Manufacturing I ● Full year course ● Helps with Honors or Technical Honors Diploma	11-12	➢ Computer-based with virtual environments ➢ Explore the manufacturing process at greater depth including the types of systems and machines used to manufacture products ➢ Design and make things for yourself, your family, the school, or the community using the laser cutter, 3D printer, and other shop tools ➢ **Dual credit with IvyTech MPRO 102, MPRO 122, and MPRO 201 (9 credits/no cost)**

		➢ **Earn 1 APICS and 1 MSSC certificate** ➢ **Honors credit:** 0.75 added to GPA ➢ **Prerequisite:** Intro to Advanced Manufacturing and Logistics